

Response to Comments Received
NTP Fact Sheet: *Radioactive Materials Package Performance*

<i>Reviewer/Organization</i>	<i>Comment</i>	<i>Response to Comment</i>
EM-76, DOE-HQ	Last Page, 3 rd Column, 2 nd Paragraph: Don't understand why this paragraph is included. It addresses one of the tests that must be performed. Recommend the paragraph be deleted or paragraphs added which explain the other tests.	All of the tests are described in the graphic on the preceding page. This text was added to clarify the concept of the unyielding surface. Added text on thermal testing.
DOE Pittsburgh Naval Reactors Office	<p>General: Change "test to "performance" and adjust throughout.</p> <p>1st Page, Title: Change to "Package Performance".</p> <p>1st Page, Caption: Change to read: "DOE maintains a testing program for packaging designs and follows all Federal standards in the design and maintenance of radioactive materials packagings."</p> <p>1st Page, 1st Paragraph, Last Sentence: Change "is a key element" to "is the key element".</p> <p>1st Page, 2nd Column, Last Full Sentence: Change "testing" to "performance".</p> <p>1st Page, 3rd Column, 1st and 2nd Sentences: Replace "test" with "performance".</p> <p>1st Page, 3rd Column, Subtitle: Change to "Types of Packagings and Performance Requirements".</p>	<p>Change made in some places.</p> <p>Agree.</p> <p>Agree.</p> <p>Disagree. Original text read "the key". Was changed to accommodate other comments that this is not the only safety element.</p> <p>Agree.</p> <p>Wording taken from NRC regulations (10 CFR 71.73).</p> <p>Agree.</p>

<i>Reviewer/Organization</i>	<i>Comment</i>	<i>Response to Comment</i>
DOE/PNR (cont'd.)	<p>2nd Page, Graphic: Replace “test” with “performance” wherever it appears.</p> <p>2nd Page, 3rd Column, 2nd Bullet: Replace “tests” with “requirements”.</p> <p>2nd Page, 3rd Column, 3rd Bullet: Replace “IP-2 tests” with “IP-2 requirements” and replace “tests required” with “requirements”.</p> <p>2nd Page, 3rd Column, 4th Paragraph: Delete: “These packagings” from the last sentence and move the remainder of the sentence up to the beginning of the paragraph, inserting between “Type A packagings” and “are designed to”.</p> <p>2nd Page, 3rd Column, Last Paragraph: Delete the last sentence on this page, starting with “Examples of materials that must be transported”. At the beginning of the second sentence, delete “They” and insert “High-level waste and spent nuclear fuel typically would require Type B packaging.”</p> <p>3rd Page, 2nd Paragraph, 1st Sentence: Replace “protect” with “retain”.</p> <p>3rd Page, 2nd Paragraph: Delete second sentence.</p> <p>3rd Page, 2nd Paragraph, 3rd Sentence: Replace “tests” with “requirements” and insert “performance” after</p>	<p>In some places, “test” is the wording in the regulations – “test” deleted where not needed.</p> <p>Disagree. Regulations spell out “tests”.</p> <p>Disagree. Regulations spell out “tests”.</p> <p>Agree.</p> <p>Wording modified.</p> <p>Agree.*</p> <p>Disagree. Previous comments indicate this needed to be added (i.e., Concord shipment issues). Computer analyses reference moved to beginning of next para.*</p> <p>*This paragraph now reads: “Type B packaging designs must undergo analyses and/or tests to determine their</p>

<i>Reviewer/Organization</i>	<i>Comment</i>	<i>Response to Comment</i>
DOE/PNR (cont'd.)	<p>“sequence of accident”. Replace “test conditions” with “requirements”. Water immersion is not sequential. Delete “a” before “crush” and delete “test” following “crush”.</p> <p>3rd Page, 2nd Paragraph: Delete the last sentence.</p> <p>3rd Page, 3rd Paragraph, 1st Sentence: Replace “tests” with “performance requirements”.</p> <p>3rd Page, 5th Paragraph, 1st Sentence: Replace “test conditions” with “performance requirements”.</p> <p>3rd Page, Graphic: Delete “test” following “Impact” in sequence number 1 and following “Heat” in 2, and after “Puncture” in number 3. Also delete “performing” after “Puncture”. Rephrase the second paragraph under sequence number 2 to read “For some low-density, light-weight packages, a dynamic crush test is required, represented by dropping a 1,100 pound mass from 30 feet onto the package resting on an unyielding target.”</p> <p>Reword second paragraph under sequence 4 to read “For fissile materials (e.g., spent fuel), packages must also perform immersed under 3 feet of water in a position where maximum leakage is expected.”</p>	

<i>Reviewer/Organization</i>	<i>Comment</i>	<i>Response to Comment</i>
DOE/PNR (cont'd.)	<p>3rd Page, Last Paragraph, 1st Sentence: Insert “analysis methods such as physical” between “with other” and “tests”.</p> <p>4th Page, 3rd Paragraph, 2nd Sentence: Replace “scale modeling cannot be used to test thermal performance” with “scale model testing cannot be used to determine thermal performance.”</p> <p>4th Page, 4th Paragraph, End of 2nd Sentence: Insert “computer analysis or” following “generating similar information by”.</p> <p>4th Page, 3rd Column, 2nd Paragraph, 1st Sentence: Insert “simulated by” before “steel or armor plate”. Replace “will be dropped” with “is dropped”.</p> <p>4th Page, 3rd Column, 2nd Paragraph, 2nd Sentence: Reword to say: “The engineering intent of the unyielding target is that all the damaging energy created by the impact is absorbed by the package.”</p> <p>4th Page, 3rd Column, 2nd Paragraph, 3rd Sentence: Change “This impact” to “This unyielding impact” and change “in an actual accident” to “in an accident in the ‘real world’”.</p> <p>4th Page, 3rd Column, Last Sentence: Replace “testing” with “performance requirement analysis”.</p>	<p>Agree. Omitted in editing process; will be changed for next printing and for NTP Website.</p> <p>Agree.</p> <p>Wording added to end of sentence.</p> <p>The unyielding target is not a simulation. What it simulates is extraordinarily severe accident conditions.</p> <p>Used similar wording to convey this message.</p> <p>Agree. Modified some wording for clarification.</p> <p>Agree.</p>
DOE-EM	<p>3rd Page, Graphics: The water pressure at 50 feet is approximately 21.7 psi. The 50 ft requirement is from 10 CFR 71.73 (c) (6), the immersion test for all packages.</p>	<p>Statement reflecting 10 CFR 71.61 requirements added to graphic in Spent Fuel fact sheet. Believe it would add too much detail for the general discussion here.</p>

<i>Reviewer/Organization</i>	<i>Comment</i>	<i>Response to Comment</i>
	The special requirement for irradiated nuclear fuel shipments, found at 10 CFR 71.61, specifies a pressure of 290 psi, which relates to a water depth of approximately 656 feet.	
Contractor Traffic Managers Association	<p>General: Lacking enough detail. Also suggest the product only cover the packages requiring testing, instead of confusing the issue by covering strong-tight containers and excepted packaging.</p> <p>2nd Page, 2nd Paragraph: The statement “Examples include contaminated equipment and radioactive waste solidified in such materials as concrete or glass” leads the reader to assume that all radioactive waste shipped in IP packaging is solidified. This is not the case. The wording could lead to confusion if the target audience becomes aware of radioactive waste shipped in IP packaging which has not been solidified. Referencing the Table 8 of 49 CFR 173.427 clearly shows liquids and even gas may be shipped in IP-2 or IP-3 packaging.</p>	<p>Fact sheet meant to convey only basic information. Believe it is necessary to mention strong-tight and excepted packagings.</p> <p>Agree. Added liquids.</p>
DOE, Nevada Operations Office	<p>1st Paragraph: Combine sentences to read: “In the United States, safe transportation of radioactive materials is achieved by compliance with Federal regulations, as well as proper packaging.</p> <p>Last Page, 3rd Column, 2nd Paragraph, 1st Sentence: Change “target” to “surface”.</p>	<p>This is a topic of frequent discussion. Believe it is important to emphasize that packaging is a key element of transportation safety.</p> <p>Agree.</p>
State of Colorado	Suggest you provide G-forces that occur on a package when subjected to a drop test. It is difficult ... to understand that the amount of force when dropped onto an unyielding surface is much greater than, say, having a train slam into a cask. A couple of G-force comparison numbers could put these accidents in perspective.	<p>Numbers probably would make it too technical. Reworded to address this comment.</p>

<i>Reviewer/Organization</i>	<i>Comment</i>	<i>Response to Comment</i>
	Often, environmental groups claim that Type B packages are not subjected to a “crush test”. A brief explanation that a crush test is for small Type A packages and makes no sense for a large Type B package could alleviate this claim.	Agree. Fact sheet states crush test necessary for low density, light-weight packages.
DOE/NV Support Contractor	<p>1st Paragraph: Delete the extra white space at the end of the first line of text.</p> <p>2nd Page, 3rd Column, 5th Paragraph: In the first sentence, you may want to explain “radiopharmaceuticals” and “low-level radioactive wastes”.</p> <p>Same Paragraph, 2nd Sentence: Change “packages” to “packagings”.</p> <p>Last Page, 2nd Paragraph, 1st Sentence: Delete “the” before “damage”.</p> <p>In the next paragraph, delete “the” after “full-size tests because”.</p>	<p>Agree.</p> <p>Believe most people will understand the term “radiopharmaceuticals”. Added 2 sentences to further define low-level radioactive waste.</p> <p>Agree.</p> <p>Agree.</p> <p>Agree.</p>
State of Oregon	<p>General: Very good fact sheet. Don’t use acronyms in caption.</p> <p>1st Page, 3rd Column, Last Sentence: This is not very clear.</p> <p>3rd Page, 1st Paragraph, Last Line: DOE is also a Federal agency. Should this sentence reference DOT or NRC or DOT and NRC?</p>	<p>Limited space does not always permit spelling out of terms. All acronyms are spelled out in text of fact sheet.</p> <p>Following sentence reworded to clarify.</p> <p>Changed to “DOT and NRC standards”.</p>

<i>Reviewer/Organization</i>	<i>Comment</i>	<i>Response to Comment</i>
State of Oregon (cont'd.)	<p>3rd Page, 1st Column, 2nd Paragraph, 3rd Sentence: There needs to be some clarification – that these tests (Type B) are when there is actual physical testing.</p> <p>3rd Page, 1st Column, Last Line: Suggest adding another sentence here: “Because of the cost, full-scale testing is conducted on only a few packagings.”</p>	<p>Reference rewrite of this paragraph above.</p> <p>Covered under scale model testing reference.</p>
State of New Mexico	<p>1st Page, Last Paragraph, Last Sentence: “meet requirements that <u>define</u> ease of handling ...”. What does “define” mean here?</p> <p>3rd Page, 1st Column, 2nd Full Paragraph: Replace “duplicate” with “simulate”.</p>	<p>Changed to “include”.</p> <p>Duplicate is the intention here.</p>
Western Governors’ Association	<p>1st Page, Under “Types of Packagings and Required Tests” you should clarify what is meant by “concentration” (level/amount of radioactivity expressed in some unit of measurement).</p>	<p>Most readers will understand. Gets too wordy to define.</p>

NOTE: “No Comment” responses received from: Indiana SEMA, ATR Institute, (UNM), Connecticut DEP/CRCPD, IA Dept. of Public Health, Association of American Railroads, NV State Rail Safety Program Managers, Texas State Energy Conservation Office (Pantex Program), IAFC, Council of State Governments, Midwest.